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A NEW FOSSIL CROCODILIAN FROM COLOMBIA

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FOSSIL remains of a gigantic crocodilian were collected by Brother Ariste (Dr. Maurice Rollet) between Neiva and the River Baché (Colombia) in 1920. The level is not recorded. Dr. J. B. Reeside, Jr., reports on the basis of invertebrates from nearby localities that the horizon is probably Lower Cretaceous. These remains consist of six fairly well preserved vertebrae, with parts of ribs, portions of maxillary and dentary bones interlocked, several isolated pieces from the posterior portions of the right and left rami of the lower jaw, and some fragments. The maxillary portion includes part of the alveolar series and was evidently situated a short distance posterior to the maxillo-premaxillary suture. These now constitute No. 10889 of the collections of the United States National Museum. I wish to thank C. W. Gilmore, of that institution, for the privilege of describing this material.

The incomplete nature of this material makes determination of the relationships extremely difficult if not impossible. Several facts, however, may be noted. The vertebrae correspond in general characters and somewhat in size with the vertebra described by Gervais as *Dinosuchus terror*. The indicated horizon is somewhat lower than the level of this form, which Gervais notes as "lower Tertiary or Cretaceous."

Comparison with the types of *Purusaurus brasiliensis* Rodriguez and *Brachygnathosuchus brasiliensis* Mook shows clearly that the form described has no close relation with either. These species, while gigantic, have relatively short and broad lower jaws, with large alveoli, while the form described has relatively long and slender lower jaws and posterior teeth, at least, of relatively small size.

¹ Contributions to the Osteology, Affinities, and Distribution of the Crocodilia, No. 35.

In view of these facts the material described is referred to a new species of the genus *Dinosuchus* Gervais (*non* Holland), which may be called *Dinosuchus neivensis*, named for the city of Neiva near which it was found.

Genus DINOSUCHUS Gervais, 1876

Generic characters.—As Gervais never separated the generic characters from those of the species *D. terror*, the following designation may be given: Size gigantic, vertebrae procoelian and massively constructed.

Relationships.—The genera *Dinosuchus* Gervais, *Purusaurus* Rodriguez, and *Brachygnathosuchus* Mook have been treated quite differently by recent authors. Nopcea, in 1924, considered *Brachygnathosuchus* to be a synonym of *Purusaurus*, and *Dinosuchus* to be independent. Because of the latter interpretation he proposed the name *Phobosuchus* for Holland's *Deinosuchus*. Mook, in 1934, considered *Purusaurus* to be a synonym of *Dinosuchus*, and *Brachygnathosuchus* to be independent. Patterson, in 1936, considered *Brachygnathosuchus* to be a synonym of *Dinosuchus*, and *Purusaurus* to be a synonym of *Caiman* of Spix.

At the present time it appears most consistent with the incompletely known characters of these forms and with their geologic levels to consider the Cretaceous *Dinosuchus* to be valid and independent, and to consider the upper Miocene or lower Pliocene *Purusaurus* and *Brachygnathosuchus* to be valid and to be closely related to *Caiman*.

DINOSUCHUS NEIVENSIS, new species

PLATES 4-9

Specific characters.—External mandibular foramen unusually large in proportion to the size of the jaw elements surrounding it, jaw relatively long and slender, posterior teeth relatively small and close together.

Description of material.—Five maxillary alveoli are visible on this specimen. The first is large and is slightly longer than it is broad. The second is larger than the first. Its external border is incomplete; consequently its proportions are difficult to determine. The last three alveoli are approximately equal to the first in size; they appear to be subcircular, although their borders are not entirely visible. Badly mutilated stumps of teeth are visible in these alveoli.

The anterior and posterior ends of the lower jaw section that is attached to the portion of the maxillary noted above exhibit sections of alveoli 12 cm. deep and fragments of teeth of corresponding size. Another section of the right ramus was located much farther back than the one noted above. The anterior end of the right external

mandibular foramen is located at the posterior end of this section and the posterior end of the alveolar row at the center of the superior border locates the position of the section in the ramus. Four alveoli with bases of teeth are clearly visible, and a fifth or last is somewhat obscure. These alveoli are much smaller than those of the maxillary section noted above, and their height, as indicated by the anterior surface of the section, is less than half that of the anterior mandibular teeth. The mandibular cavity, now indicated by matrix, was large, the bony substance being thin.

The left ramus is represented by a larger section, about 48 cm. long and composed of two pieces that make clean-cut contacts with each other. This section is entirely posterior to the alveolar row and includes the external mandibular foramen, of which the superior boundary is incomplete. The posterior end of this section is near the posterior end of the ramus immediately anterior to the glenoid surface. The sutures separating the elements of which this part of the jaw is composed are indistinct, the dentary, angular, and surangular bones being almost indistinguishable from one another.

The external mandibular foramen is unusually long and is not very high. The exact relation between length and height cannot be made out because of the incomplete superior border. On comparing the length of this opening with that of an 84-cm. ramus of *Crocodylus acutus*, and assuming that the proportions between the total length and the length of the foramen are the same in that species and the form now described, we estimate that the total length of the ramus would be 280 cm., or about 9 feet. Comparison with a 32-cm. ramus of *Caiman crocodilus* indicates a total length of 172 cm., or about 5 $\frac{2}{3}$ feet, which is more likely.

One of the vertebral units is composed of the intercentrum of the atlas, most of the axis, and the proximal portions of the atlas and axis ribs in natural positions. The atlas intercentrum is a broad, flat bone, much more distinctly bifurcated posteriorly than in *C. acutus*. The atlas ribs attach to the bifurcations and their axes of breadth lie *below* the axis and the axis ribs. The atlas ribs are single headed, of course, and are considerably thickened where they attach to the atlas intercentrum.

The characters of the axis are not particularly distinctive except for the size and strength of the processes to which the ribs are attached. The ribs themselves are distinctly two-headed, the upper element, or tuberculum, being slightly larger than the lower one, or capitulum. The shaft is slender and is situated on edge, at right angles to the position in which the atlas ribs are situated.

Six other vertebrae are preserved, but none of them is complete. Two of these united together, with a fragment of a third, are cervicals,

probably 4 and 5. The spines and the postzygapophyses are not preserved. The prezygapophyses, diapophyses, and parapophyses are incompletely preserved. The centrum of the first vertebra of the pair is incomplete. That of the second is complete and is moderately long, rather low vertically and narrow posteriorly but broad anteriorly, apparently convex posteriorly, but the degree of convexity cannot be made out. The prezygapophyses and diapophyses of this vertebra are incomplete, but enough of them is preserved to indicate that they were very stout. There is a very small median hypapophysial keel near the anterior end of the centrum. On the whole the vertebrae appear small for the size of the mandible. The capitular and tubercular ends of the left rib of the anterior of the two vertebrae are preserved; they are very stout, especially the tubercular process.

MEASUREMENTS (IN MILLIMETERS)

Length of two large contact pieces of left ramus of mandible.....	492
Maximum height of same.....	171
Length of external mandibular foramen.....	265
Height of same.....	56
Length over four posterior alveoli, right ramus of mandible.....	82
Height of maxillary and dentary fragments in place with each other....	211
Height of anterior mandibular tooth shown in end of this fragment.....	94
Breadth across atlas centrum, posterior end.....	88
Length of atlas centrum.....	70
Breadth across right atlas rib at proximal end.....	49
Breadth across left atlas rib at proximal end.....	47
Breadth across tuberculum end capitulum of right axis rib.....	43
Breadth across tuberculum end capitulum of left axis rib.....	¹ 46
Breadth across axis centrum posterior end.....	60
Length of fifth(?) cervical centrum.....	83
Breadth of fifth(?) cervical centrum anterior end.....	103
Breadth of fifth(?) cervical centrum posterior end.....	¹ 70
Breadth of fifth(?) cervical vertebra across prezygapophyses.....	¹ 97

¹ Estimate.

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